I will make my own Black Hole interactive simulation using all relevant factors such as the "size of the black hole", by either entering its respective Schwarzschild radius or object`s mass (rs = 2 x G x mo / c2), amount of incoming matter increase / decrease, singularity on / off, rotation on / off, magnetic field on / off, matter swallowing proportionally increasing the S. r. and object`s mass with adequate Black Hole and environment picture change, accretion disk on / off, gravity force automatic adjustion (according to the object`s mass), Hawking radiation, the jets of the particles and quantum tunneling...That will be the version 1.0.

In the version 2.0 I will add spacetime distortion.

Version 3.0 will depict a spacecraft entering the Black Hole.

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05/05/2023

Before I start making my own black hole simulation I decided to check what is already available regarding this subject.

I have chosen realistic physics-based space simulator Universe Sandbox v 2.32.1 and Everspace video game.

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Universe Sandbox v 2.32.1:

It is an application that simulates space objects movement and behaviour but it also offers set of interesting tools which can be applied to desired target in order to produce certain effect on it. You can fire lasers, plant explosives, spin or push objects, fly to an object, crash objects, etc. You can even create your own galaxies and solar systems.

Every object has extensive info about itself enabling you to learn and play

simultaneously...

Earth`s surface gravity is 9.82 m/s2.

Earth`s escape velocity is 11.2 km/s.

Earth`s age is 4.5 gigayear (four and half billion years).

There is an evident lack of detail. For example, Neptun has no storm and Saturn has no ring but you can add one if you want.

I tried firing laser. It was preset to red spectrum (650nm). I changed it into violet (400 nm). I also increased power to be 10 JW (Yotta Watt) instead of "just" 1. Additionally, you can set parameters like radius, power per area and medium. I switched medium from Ruby to Xenon Fluoride. I selected dwarf planet Makemake, referred to as an asteroid in this sim, as my target and blasted it few times leaving visible patterns on its surface.

I set beam radius to only 1 mm and locked it. I increased total power to be 10`10 YW which changed power per area to be 8 x 10`15 YW/m2. I switched background to Nebula Green for better view.

First laser blast shredded Dimorphos. It also took one for Didimos. It took 3 hits to blast off Makemake. Then I used same thing on Pluto. It didn`t broke but with each hit its temperature raised for thousands of Celsius. After several successive hits Pluto became red hot. Earth turned into a global desert after just one shot fired at India. Second and each consecutive shot pushed Earth like billiards cue ball further and further away.

I opened "explosion" tool. Preset was expressed in Megatones of TNT but I immediately switched to the most powerful explosion available - SuperNovae Type 1a. Watching our Sun turn into a SuperNova was spectacular sight indeed.

Then I used push force of 10`20 GN (GigaNewton) against the Earth. After a minute I checked Earth info box and found that its distance is 366 AU.

I used spin force of 100.000 GN at Dimorphos asteroid. It started rotating so fast that it literally fragmented. After reseting, I used equal push force and moved Dimorphos far away.

I watched Milky Way and Andromeda simulated collision. Their supermassive black holes soon merged and swallowed everything around.

I traveled to Alpha Centauri A.

It is interesting to look at our Solar system from a space perspective. You can see all planets and asteroids revolving the Sun. The mass change proportionally influences objects orbital velocity.

Now I will turn our Sun into the supermassive black hole size of the Sagittarius A (mass = 8.26 x 10`36 kg (4.3 million solar masses), diameter = 23.5 million km). Data extracted from

https://www.space.com/sagittarius-a

Black hole swallowed our entire solar system.

I tried 14.8 solar masses (Cygnus X-1 mass) and the result was almost the same.

Cygnus X-1 distance is approx. 6.000 ly (six thousand light years) according to the newest calculations made by

https://www.nasa.gov/mission_pages/chandra/multimedia/cygnusx1.html

This app brings to you hours and hours of fun.

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Everspace:

(to be continued)